COPY

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
MAREK ALBOSZTA
LUMEN IPS
2345 YALE STREET
2ND FLOOR
PALO ALTO, CA 94306

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Applicant's or agent's file reference SRI-110/PCT	Date of mailing (*day/month/year*) 13 MAY 2005 FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date (*day/month/year*)	Priority date (*day/month/year*)
PCT/US05/03090	21 January 2005 (21.01.2005)	23 January 2004 (23.01.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): A61K 49/00 and US Cl.: 424/9.1; 9.6; 600/317

Applicant

SRI INTERNATIONAL

1. This opinion contains indications relating to the following items:

- ☒ Box No. I — Basis of the opinion
- ☐ Box No. II — Priority
- ☐ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV — Lack of unity of invention
- ☒ Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI — Certain documents cited
- ☐ Box No. VII — Certain defects in the international application
- ☐ Box No. VIII — Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(*b*) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Michael G. Hartley Telephone No. (703) 308-1235

Form PCT/ISA/237 (cover sheet) (January 2004)

COPY

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/03090

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US05/03090

Box No. V Reasoned statement under Rule 43 *bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1-22	YES
	Claims NONE	NO
Inventive step (IS)	Claims NONE	YES
	Claims 1-22	NO
Industrial applicability (IA)	Claims 1-22	YES
	Claims NONE	NO

2. Citations and explanations:

Claims 1-22 lack an inventive step under PCT Article 33(3) as being obvious over Klaveness (US 6,159,445) in view of Alfano (US 5,371,368) in further view of Brandenburger (US 5,406,950). Klaveness discloses a method of imaging a region of interest comprising acquiring images, introducing varying levels of inspiratory (gaseous) contrast agents to the region and obtaining measurements by optical imaging to acquire images of various tissues, see columns 7-8. The gaseous contrast agents include carbon dioxide and oxygen (i.e., air), see column 12. The methods may be used to image various tissues, organs, tumors, etc., see column 18, lines 59+. The optical imaging systems include the use of systems that employ various wavelengths, as claimed, various controllers, etc., see columns 8-9. Klaveness fails to specifically disclose that the methods employ measurements to oxy- or deoxy- hemoglobin, as claimed. Cheng teaches methods of optical imaging for various tissues, tumors, etc. may be performed by measuring oxy and deoxy hemoglobin to determine the presence of ischemia to diagnose various diseases, se columns 1-2 and 7-8. It would have been obvious to measure oxy and deoxy hemoglobin levels in the methods of Klaveness because it is well known in the art that measuring the concentration of hemoglobin in optical imaging methods provides a means of imaging various tissues to diagnose disease, as shown by Cheng. Further, it would have been obvious to one of ordinary skill in the art to administer the contrast agents by inhalation because Brandenburger teaches that inhalation provides the advantage of being less invasive for delivery of the contrast agent, see columns 1-2.

Claims 1-22 meet the criteria set out in PCT Article 33(2), because the prior art does not teach the methods of optical imaging employing both gaseous contrast agents and the measurement of hemoglobin as claimed.

Claims 1-22 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.